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ABSTRACT

Since psycholinguistic research suggests that readers ascribe meaning by sampling grapho-phonemic, syntactic, and semantic text features, a study was conducted to investigate which cue strategies readers of different abilities utilized, and whether these strategies were mediated by levels of cognitive development. The subjects were 50 second grade students who completed two Piagetian tasks. The subjects also performed an oral reading task, which was analyzed to identify the types of reading errors the subjects made. The results of a stepwise discriminant analysis indicated that cognitive development tasks may primarily evaluate reading readiness. The data also suggested that proficient readers were particularly sensitive to semantic text cues. (Author/RL)

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Cognitive Development and Miscue Patterns of Differentially Skilled Readers

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Psycholinguists view reading as both a cognitive and a language process. It is presumed that the reader uses knowledge of the world and knowledge of language together in order to gain meaning from the printed page (Goodman, 1970). Furthermore, some psycholinguists argue that skilled readers do not use all the information which is available to them when reading. Instead, as Kavale and Schreiner (1978, p. 35) note, prediction "based on better sampling techniques, greater control over language, and broadened experience [giving increased cognitive development] is viewed as more useful than absolute word identification." Unfortunately, psycholinguistic theory offers an incomplete understanding of how readers acquire these sampling skills or of how readers recognize the errors, i.e.--miscues, which these sampling or prediction skills inevitably produce upon occasion.

Some researchers (cf. Goodman, 1969) have argued, however, that an improved understanding of these phenomena might be acquired by investigating the "miscues" which young readers make during oral reading. Allen (1976, p. 7) has defined a "miscue" as a "deviation between the oral response of the reader and the expected response of the text." Miscue analysis and other approaches to reading research have lead to a recognition that young readers rely upon three types of cue systems when they sample clues to meaning from text. It is clear that readers rely upon grapho-phonemic cues when they ascribe meaning to text. For example, Barbe (1965) found that mispronunciations in oral reading are quite frequently accompanied by inaccurate comprehension. It is also clear that readers rely upon syntactic cues when ascribing meaning to text. As Clay (1968, p. 437) indicated, "there is a high incidence of syntactic equivalence between error substitutions and the textual stimulus." Finally, readers rely upon semantic cues when ascribing meaning to text (Blachowicz, 1978). As Bransford and McCarrel (1974, p. 207) note, "people carry meanings, and linguistic inputs

merely act as cues which people can use to recreate and modify their previous knowledge of the world."

One factor which has impeded understanding of miscue phenomena is the complexity of the required analysis. As Goodman (1973, p. 9) indicated, "the coding of the miscues of an average reader calls for approximately 2000 separate decisions." Nevertheless, it is known that readers use different reading strategies when reading passages with different levels of difficulty (Hood, 1978; Kirby, 1979; Williamson and Young, 1974). This suggests that teachers may need to respond differently to miscues made by readers with different ability levels, because superficially similar miscues might still represent different cognitive processes.

This study was conducted to determine which miscue patterns differentiate readers of varying ability levels. Six of the variables in the study were miscue categories adapted from those proposed by Goodman and Burke (1972). Scores on two additional Piagetian tasks were also included in the analysis in order to determine whether level of cognitive development mediates which patterns of miscues readers make. Several researchers (cf. Cox, 1976; Kirkland, 1978) have demonstrated linkages between levels of cognitive development and reading achievement.

Method

Subjects

Subjects (n=50) were second grade students from a middle class public school. Subjects were selected from a school with children from relatively homogeneous socio-economic backgrounds in order to reduce confounding of results. The subjects ranged in age from 81 months of age to 102 months of age ($\bar{X}$=90.5, SD=4.0). Twenty-seven subjects were females and 23 subjects were

males.

Procedure

All subjects were taped reading aloud and retelling passages from the Woods-Moe Analytical Reading Inventory (1977). Taping was done individually in a small private room. Oral reading and retelling began with the primer level of the Inventory and continued through succeeding levels until a frustration level was reached. It is important to emphasize that finding a frustration level for a reader does not imply the degree of emotional frustration which a passage produces in the reader. Instead, frustration refers to the proportion of miscues which a reader makes, and to the degree of reading comprehension which the reader exhibits. In this study, a passage was considered to be at a subject's frustration level when the subject demonstrated less than 90% word recognition accuracy, i.e.--miscues exceeded 10%, and the subject also exhibited less than 75% comprehension accuracy (Betts, 1936; Killgallon, 1942; Woods and Moe, 1977).

When a subject reached frustration level, the subject then read two passages at that level from the Inventory. Both passages involved similar topics. Two passages were read in order to insure generation of enough miscue data for the analysis. The tapes were subsequently scored for six categories of miscues (Goodman and Burke, 1972):

1) grapho-phonemic similarity--the number of miscues for which a high degree of graphic or phonemic similarity existed between the miscue and the relevant text feature;
2) grammatical acceptability--the number of responses containing miscues which were grammatically acceptable;
3) semantic acceptability--the number of responses containing miscues which

conveyed meaning and were semantically acceptable in relation to prior and subsequent text;

4) no meaning change--the number of miscues which did not change the meaning of the text;
5) correction attempts--the number of miscues for which correction was attempted;
6) correction successful--the number of miscues for which correction was attempted and successful.

On a different day the subjects individually completed two Piagetian tasks. The first task was the well-known conservation of liquid volume task. The subjects were each shown a short, fat container and a skinny, tall container. Both containers actually had identical volumes. One container was filled with colored liquid, and then the liquid was poured back and forth between the containers. Each subject was then asked whether one container held more, less, or an equal amount of liquid when compared with the other container, and how the given conclusion was reached. In the traditional manner, responses were then scored "nonconserver," "transitional conserver," and "conserver." Each subject also completed a task which tested development of the concept, "brother/sister" (cf. Elkind, 1962; Clark, 1973).

Results

The subjects were grouped into seven reading frustration levels (1=lowest ability, 7=highest ability). Then a stepwise discriminant analysis was performed to determine which of the eight predictor variables contributed significantly to the differentiation of the seven frustration groups, and to determine if the selected predictor variables differentiated the groups beyond a chance level (α=.05). Four variables contributed statistically substantial and relatively unique information toward efforts to differentiate the seven

frustration groups of subjects.

Two statistically significant discriminant functions were identified. The first function (χ^2=63.19, df=24, p<.05) was primarily useful in differentiating frustration groups one through three from frustration groups five through seven, as determined by examining the centroids for the function. The second function (χ^2=25.33, df=15, p<.05) was primarily useful in differentiating frustration level groups one, two, six, and seven from frustration groups four and five. The discriminant function coefficients, structure coefficients, and centroids calculated in the analysis are presented in Table 1.

Insert Table 1 about here.

Discussion

These results have several implications for psycholinguistic theory and for instructional practice. For example, some reading educators value correction attempts as indicators that students are reading for meaning. However, the results indicate that the "correction attempted" and "correction successful" variables did not contribute substantially to differentiation of the various frustration level groups. In other words, more able readers when compared with less able readers did not systematically tend to recognize or correct more of the the miscues which they made. This result suggests that instructing readers to detect miscues in their reading will not necessarily insure that higher reading proficiency will be achieved.

The failure of the two cognitive development measures to differentiate the frustration level groups has important implications for psycholinguistic theory and research practice. The result was not an artifact of all subjects having achieved similar levels of cognitive development. Thus the result suggests that a closer examination of the linkages between cognitive development and reading ability is in order. More advanced cognitive development is apparently a

necessary condition for achieving advanced reading skills, as indicated by past research. But higher levels of cognitive development are certainly not sufficient guarantees that readers will be more proficient at ascribing meaning to text. Consequently, cognitive development measures should be interpreted as reading readiness measures only. This is a subtle but important distinction which has not been sufficiently reflected in the literature on reading.

The Table 1 coefficients indicate that readers with higher frustration levels are differentiated from readers with lower frustration levels primarily by a tendency to make miscues which are semantically correct and to make these miscues in sentences which are grammatically correct. This first result is consistent with recent schema theory research, and suggests that readers, even when reading aloud, are sensitive to the semantic as well as to the syntactic features of text (Bransford, Barclay, and Franks, 1972). The pattern that readers with high frustration levels make miscues which are nevertheless grammatically and syntactically acceptable reinforces an interpretation that readers with higher frustration levels may be more semantically oriented than other readers, and in fact may sample and regenerate grammatical text features in a virtually automatic fashion.

Overall, the results confirm that the semantic features of prose are important to readers, even <u>vis a vis</u> their miscues. This suggests that teachers should respond differently to miscues which do not involve meaning changes as against miscues which do involve meaning changes. The former might be considered "good errors" (see Goodman and Burke, 1972; Hood, 1978) which merit more positive reactions. Indeed, miscues which do not involve meaning changes may even be desirable if they reflect semantic processing in anticipation of semantically organized storage of meaning in memory.

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TABLE 1

Function Coefficients and Centroids

	Function I			Function II		
Variable	Unstandardized Function Coef.	Structure Coefficient	Centroid/ Group	Unstandardized Function Coef.	Structure Coefficient	Centroid/ Group
Grapho-phonemic similarity	-.205	-.128	-2.0 (1) -0.6 (2)	.083	.742	-0.4 (1) -0.2 (2)
Grammatical acceptability	.352	.441	-1.0 (3) 0.1 (4)	-.058	.770	0.2 (3) 0.7 (4)
Semantic acceptability	-.369	.005	1.0 (5) 1.4 (6)	.129	.941	0.8 (5) -0.3 (6)
No meaning change	.257	.275	0.8 (7)	.680	.303	-1.6 (7)
Constant	.028	----		-3.043	---	